

ABSTRACT OF THE DISCLOSURE

The present disclosure provides artificial heavy metal binding proteins termed chelons by the inventors. These chelons bind cadmium and/or mercuric ions with relatively high affinity. Also disclosed are coding sequences, recombinant DNA molecules and recombinant host cells comprising those recombinant DNA molecules for expression of the chelon proteins. In the recombinant host cells or transgenic plants, the chelons can be used to bind heavy metals taken up from contaminated soil, groundwater or irrigation water and to concentrate and sequester those ions. Recombinant enteric bacteria can be used within the gastrointestinal tracts of animals or humans exposed to toxic metal ions such as mercury and/or cadmium, where the chelon recombinantly expressed in chosen in accordance with the ion to be rededicated. Alternatively, the chelons can be immobilized to solid supports to bind and concentrate heavy metals from a contaminated aqueous medium including biological fluids.

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